

**MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004**

First Day – Wednesday, 2/11/04

Introduction

- Jim Collins, Manager of the SRS Environmental and Bioassay Laboratory, welcomed the participants to the meeting. He briefly described the function of his laboratories as they apply to occupational safety and health.
- Kathy Creek, Los Alamos National Lab representative and chair of the Beryllium Health and Safety Committee (BH&SC), welcomed participants and stressed the importance of the Analytical Subcommittee. She gave a bit of background on discrepancies in Be quantities detected in LANL swipe samples. These discrepancies gave rise to evaluation and improvement of the LANL Be analysis technique. She stressed that some labs performing Be analyses still may be unaware of potential problems with their Be quantification methods.

General Discussions

- Dan Marsick, DOE-HQ (EH-51), briefed group on DOE's preparation to adopt 10 CFR 851 which is supposed to be a clarification of DOE Order 440.1a mandated by Congress. Based on comments received from reviewers of the document, DOE is changing some of the language in 851 to clarify.
- Mike Watkins, ORNL, discussed modifications to the Be Release Criteria Workgroup guidance document, based on input from the Nov. '03 BH&SC meeting have been made. Originally, the document was to recommend a single approach to Be analysis, but it is now felt that a multi-pronged approach is better. The guidance document was envisioned to address release criteria, characterization, and remediation. Sub-groups were formed to deal with each of these issues. With regards to sampling, a statistician has been consulted to assist in surface sampling protocol development including consideration for dirty environment, when is clean clean enough, different swipe matrices, etc.. They are using the Y-12 rad swipe protocol as template for the sampling portion of the document. Input provided by Mike Brisson to the analytical portion of the guidance document has been incorporated. The question was raised as to whether the document would be completed by the BH&SC Aldermaston meeting. The draft is in good shape, but not ready for general dissemination. Watkins will send it to interested subcommittee members for review.
- Highlights from the National Jewish meeting are posted on the BH&SC website. These were provided by Jenelle Morris (Rocky Flats) and briefly reviewed by Mike Brisson. Some study highlights include:
 - 10% of exposed workers become sensitized –of that 40-50% develop CBD;
 - cancer rates at Reading, PA alloy production facility showed an increase with exposure to Be indicating it is potentially a carcinogen;
 - study on particle size and morphology of high-fired vs. low-fired BeO showed lower health risk associated with high-fired materials due to less surface area for exposure; and
 - study of Tuscon ceramics plant workers supports skin exposure as possible route for sensitization; a discussion ensued concerning the need to minimize dust resuspension in Be work areas.

Steve Jahn briefed on the progress of completion of a questionnaire to be issued to Be analytical entities. Several suggestions for modifications to the questionnaire were made in an effort to clarify some of the questions and capture the information required to assess the current status of Be analysis within DOE and other Be analytical entities. Several highlights of that discussion follow:

- One major problem is that BeO standard isn't available.
- Jahn wants to bring Be analytical issues to consciousness of DOE-HQ to get prioritization.
- The question of "how is chronic beryllium disease (CBD) formed" was raised.
- Some IH groups don't sample consistently, e.g., same swipe matrix, same number of swipes per unit area, etc.
- Sandia National Lab is adopting a statistically-designed sampling method.
- Subcommittee agreed that input from IH and analytical entities from each site is desirable and that a coordinated site effort should produce one response to the questionnaire per site/entity, which should be submitted to Jahn.
- General consensus of the group was that it's desirable to analyze samples shortly after chemical preparation, however that may not be possible – should maximum storage time be specified?
- Who declares equivalence as defined in 10CFR 850?

**MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004**

Kevin Ashley explained protocol for developing a method into an ASTM standard (this presentation is on the BH&SC web site). The number of standards committees numbers over 30. Kevin suggested that a Be standard method would be fostered through the D-22 committee. The issue was raised that more DOE support for membership in ASTM committees is needed. Kevin agreed to shepherd a method through ASTM. He stated that proficiency testing isn't required for the first pass of a method, but is required for subsequent revisions. NIOSH or OSHA would prepare standard reference materials and send them to 6 laboratories for analysis using the proposed protocol. ASTM receives the resultant data and compiles it. ASTM practices due process by considering all views toward the method and allowing appeals. The standard must be flexible enough to allow for variations using as wet and/or dry depending on material to be wiped, etc. The group reached the consensus that the ASTM approach is likely faster and far less costly than other standardization processes.

Paula Cable-Dunlap presented an update on Savannah River Technology Center efforts to develop a field beryllium swipe analyzer (this presentation is on the BH&SC web site).

Kathy Creek reminded the group that this subcommittee is not a DOE committee; that it transcends DOE and that it cannot officially make recommendations to DOE or other U. S. government agencies.

Larissa Welch, Y-12, was requested by DOE to monitor labs performing IH analysis of Be filters and briefed group on status of the proficiency-testing program. There were 26 participating labs from the US and Canada enrolled in the first proficiency study. The costs of the testing were shared by all participants resulting in enormous cost-savings to Y-12 that prepared and issued the test samples. In FY-03, 900 proficiency samples were prepared. AIHA plans to extend the scope of this program by incorporating BeO into the test samples. Y-12 is currently developing the appropriate matrix in which the BeO should be for this testing. Issues regarding shipping of the material have surfaced and are causing considerable difficulty for the program. If anyone has questions about the proficiency testing program or you want to become a participant, contact Larissa and she will provide the necessary contact information. A discussion regarding the appropriate BeO to use for this study ensued. High Purity has a BeO that's 99% pure (UX025) and has been well characterized.

Tom Oatts, Digestion Group lead said that the Jahn questionnaire serves as the basis for developing a path forward for the digestion team.

Kevin Ashley, Analysis Group lead, agreed that results of the questionnaire need to be complied to assess status of analysis in the Be community and forge future plans. Based on the general consensus of the group, Kevin will initiate work on standardizing a Be swipe and analysis methods.

The subcommittee then brainstormed to develop an issues list (Attachment 1). Each issue was then either assigned to one of the working groups for Thursday's breakout sessions, or was binned as a cross-cutting issue to be considered by the subcommittee as a whole.

Wednesday's meeting ended with a recap by Mike Brisson of the Be issues identified during the day's sessions. These issues are listed below in no particular order:

- sampling,
- digestion,
- analysis methods,
- accreditation,
- future needs, and
- crosscutting.

Of particular interest to the Be community are current vulnerabilities, methods used, consistency, and communications. The group was left with the following questions and/or reminders:

- How do we, as a committee, address these issues,
- What analytical guidance does the Be community need?
- Our work shouldn't stray outside the purview of the analytical subcommittee.

**MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004**

Second Day – Thursday, 2/12/04

The group opted to remain assembled rather than have breakout sessions owing to the small number in attendance. The issues from the previous day's bin list were discussed within their assigned groupings (first Digestion, then Sampling, Analysis/Accreditation, Future Needs, and Cross-Cutting). Details of this discussion are in Attachment 2.

Several issues were resurfaced including the issues regarding shipment of the BeO standards being prepared by Y-12. Jahn agreed to work with DOE-HQ to try to get clarification and resolve some of these issues. Once clarification of the shipping regulations is obtained, each respective site will have to work with their local field office to gain approval to ship as field office directives may supercede HQ/DOT rules.

Creek briefed on the list of DOE's Opportunities for Be Research and Development. The listing is posted on the BH&SC website. Calls for proposals addressing these needs should be issued later in FY04 and in FY05 from NNSA and DOE's Office of Science.

Jahn's questionnaire will be issued shortly. Response will be requested one week following issue of the survey.

An action item list was developed from discussion of the bin list and issued to meeting participants. Brisson requested that each member peruse the action items and each group prioritize the issues associated with that group. The action items will be discussed during the next conference call (2/24/04, 11 AM Eastern). Conference calls will continue to be held every other Tuesday at 11 AM Eastern.

List of In-Person Participants

Kathy Creek, Los Alamos National Lab, BH&SC Chairman
Mike Brisson, Savannah River Site, Analytical Subcommittee Chairman
Melecita Archuleta, Sandia National Lab (New Mexico)
Kevin Ashley, NIOSH, Cincinnati (Analysis/Accreditation Working Group Lead)
Paula Cable-Dunlap, Savannah River Site
Sandra Cruz, Los Alamos National Lab
Amy Ekechukwu, Savannah River Site (Future Needs Working Group Lead)
Steve Jahn, Savannah River Site (Sampling Working Group Co-Lead)
Tom Oatts, Y-12 (Digestion Working Group Lead)
Josephine Stegall, DOE Savannah River
L. P. Singh, DOE Savannah River
Larissa Welch, Y-12

List of Remote Participants

John Bishop, U. S. Navy
Geoffrey Braybrooke, U. S. Army CHPPM
Rick Copeland, Pantex
Maureen Hamilton, Hanford
Dan Marsick, DOE-HQ (EH-51)
Joseph Samuels, Hanford
Mike Watkins, Oak Ridge National Lab

Special Thanks to:

Jenelle Morris, Rocky Flats (material from National Jewish meeting)
John McKenney and Dennis Loble, Sandia National Labs (Web support)
Jim Collins, Ronie Spencer, Cynthia Turnipseed, Sharon Chapman, Lynette Connelly (host support at 735-B)
Savannah River Technology Center (funding for lunches and snacks)
Burney Hook, SRS Industrial Hygiene Lab Director (tour of 735-B IH Lab)

Attachments

1. First-Day Issue Bin List
2. Second-Day Working Group Discussion Summary

**MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004**

**ATTACHMENT 1
First-Day Issue Bin List**

| Issue | Group |
|--|---------------|
| Wet versus dry | Sampling |
| Do we need correction factors? | Sampling |
| Hope folks use same procedure @ given facility for comparison (studies done w/factors 10+ wet/dry) | Sampling |
| Use wet on hard surfaces, dry on softer surfaces (e.g., carpet) | Sampling |
| Wetting material - water, oil, etc. | Sampling |
| Can LLNL share wet vs. dry study? | Sampling |
| Compile results of studies | Sampling |
| To do appropriate study, need to have standard deposited on surface, then wipe; don't do wipes of lab (inhomogeneity) | Sampling |
| If surface contam. Is health risk, need std. material to sample; dictated in part by regs; at present, no guidance | Sampling |
| Integrate collective sampling efforts and communicate priorities to Be community | Future Needs |
| If sampling method dictated by design authority, can't deviate; few methods fall into this category | Sampling |
| If method is in ASTM, would more labs use it? | Sampling |
| Need statistically valid study of wet vs dry | Sampling |
| Workers concerned that dry wipe may not pick up Be off surface | Sampling |
| Need method that solubilizes all forms of Be present in solution | Digestion |
| Need proficiency test samples that are matrix-matched | Analytical |
| Need calibration and QC standards that are safe to use | Future Needs |
| Overall issue of standards: proficiency testing isn't robust enough; MUST BE to ensure worker health | Analytical |
| Can't even get BeO into labs to conduct testing | Digestion |
| Need relief for shipping samples/standards | Digestion |
| Certified reference materials with concomitants | Analytical |
| Interferences and concentration levels | Analytical |
| Waste issues (environmental folk may classify it as SRCRA); need clarificationj (NOT RCRA) | Digestion |
| Y-12, segregating waste - send PPE, etc., back to Be facility that has Be waste stream identified | Analytical |
| Provide input to AIHA on needs | Accreditation |
| Should we standardize analytical protocol? | Analytical |
| Do we need one ASTM standard, or more than one? (ASTM has wet wipe procedure, air sampling, ICP in review, vacuum technique) | All |

MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004

| Issue | Group |
|---|---------------|
| Will standardizing smaller pieces of protocol be better than having one larger protocol? Would one larger protocol lend more credibility for method? | Analytical |
| Membership: do we need to add commercial labs? | All |
| Shouldn't we have folk from sampling side of the house? | Sampling |
| There's no market for commercial Be analysis so commercial entities are unlikely to participate. | Accreditation |
| Is there a group nationally that has sampling expertise? | Sampling |
| DOE needs to provide seed \$ to NIST to produce SRM for BeO work. | Future Needs |
| Need to publish articles on findings of subcommittee | All |
| Need common set of terms (each working group should develop list to be assembled by full subcommittee) | Each Group |
| Hold times between digestion and analysis? | Digestion |
| Who declares equivalence? Which method should be used? Would a standard method help? | Analytical |
| Is there a device/method that will provide constant pressure for wipe sampling? | Sampling |
| How do we get buy-in from entity declaring "equivalence" for using standard method (e.g., ASTM)? | Future Needs |
| Restrictions on travel and video-conferencing are deleterious for subcommittee | Future Needs |
| Do we need to identify instrumental shortfalls in a guidance document? | Analytical |
| Work issue of potential conflicts between 10 CFR 850 and 10 CFR 851 (accreditation vs equivalence, pecking order, etc.) | All |
| Develop input for revisions to 10 CFR 850 | All |
| Can we get an ICP-MS method for Be? | Analytical |
| Compile common set of issue from committee back to regulatory agencies | Future Needs |

**MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004**

**ATTACHMENT 2
Second-Day Working Group Discussion Summary**

Digestion

- Need digestion method for high-fired BeO; if robust enough, it will take all other forms with it.
 - SRTC is looking into sonicating samples to facilitate digestion.
- Questionnaire results will give ample info on digestions.
 - Don't want to re-invent the wheel.
 - Need to compile data and make available to all interested entities.
 - It's clear that a "tightly regulated" protocol (standard) is not desirable to accommodate all labs.
 - Address issues with digestion such that suggested direction, rather than requirements, is provided.
 - Must have performance requirements that must be met.
 - As long as digestion is good, method doesn't matter so much.
 - Y-12 will participate in study of material that likely presents problems.
- Get info out about BeO problem regarding NIOSH 7300 standard digestion; then, Need to publish results of MTS study of 7300 digestion vs. more robust method.
- Our responsibility to let lab(s) performing work know that we want to know total Be, including all forms)
- Must pay attention to terms of contract with regards to data quality.
- AIHA sponsors a listserve for listing concerns, data, etc. – need to tell IH folk that they have a problem.
- Larissa will communicate info on BeO to AIHA listserve.
- AIHA should send out a leaflet with each proficiency test sample.
- Chris Brink (LANL) is working on BeO; will give data to him to compile as well.
- Can't get BeO into lab to test – site requirements make acquisition difficult if labeled.
 - Some sites make it difficult to move material from one building to another. Shippers don't have same labeling requirements.
 - Solution is to label inside package.
 - Y-12 can't ship BeO; need approval from Dept. of Commerce.
 - Need DOE buy-in to change rules – site by site
 - Find out constraints.
 - Need DOE input to change rules. Steve Jahn will work with DOE-HQ to get help for shipping BeO samples.
 - DOE site reps can supercede DOE-HQ instructions and/or DOT regulations, so need to get site approval.
 - Need support from local DOE to change local rules.
- Waste: need clarification that Be is not a RCRA waste (currently shows up only on LDR criteria)
 - Waste is an individual site issue only. If folk have issues with waste, communicate to committee for consideration.
- Turnaround time for samples between digestion and analysis:
 - At method level, need discussion of containers and stability issues. Build into performance base. Validation should include long-term stability.
 - Melecita Archuleta will get stability of real wipe samples data to Tom Oatts.
 - Tom will conduct stability study using low-level standards in real matrix (actual wipes).

Sampling

- "Wet vs. dry" – Steve Jahn will re-address after receipt of input from questionnaire.
- Can we normalize dry and wet? Would standardize sampling – ultimate goal will be to have consistency.
 - Y-12 runs some wet, some dry, some big, some small – takes longer to do wet. Using ghost wipes increases volume and makes reporting limits less good.
 - Can't close on correction factor because there may be cases where only dry or wet can be used.
 - Kevin Ashley thinks size, collection efficiency, robustness of collection material can be standardized, similar to Pb work standard. Took 5-6 years to get Pb standards on stree.
 - Isn't a wipe a wipe, whether it's Pb or Be? Can't we piggy-back onto wipe sampling for Pb?

MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004

(Attachment 2, continued)

- ASTM sampling method is wet. Kevin feels wet wipe procedure may be a done deal. If larger wipe is OK (ghost wipe, Ransco wipe, etc. – 4 total)? These wipes have been evaluated for collection efficiency. Dry wipes have, no doubt, lower collection efficiencies than wet. If everyone is wiping the same way, it's better than 100 different methods. Consensus that you can't compare dry to wet wiping.
 - Kathy Creek could do sampling if someone could run them.
 - Y-12 can run the samples.
 - Prepare standard plates with BeSO₄ in grid. Kathy will put together sampling plan to prepare samples and give to group for comment.
 - Kathy wants everyone's buy-in prior to beginning. Could involve 200-300 samples. Testing concentration, wipe material, deposition surface. Finished concrete, stainless steel, alternate room finish surface (benchtop, tabletop).
- Hope folk use same procedure in given facility. Should we try to give guidance to IH folk? Have to have training plan for IH techs. Sandia is training folk on wipe protocols.
- Y-12 needs support to get training on IH sampling. Disconnect between IH and Lab. Tom can't talk to IH techs. Should turn samples away if they're not on correct wipe or sample number is incorrect. Just need attention to detail.
- Wetting material for wipes. In ASTM procedure, give options. Most use water, some methanol. As long as collection efficiency doesn't suffer, it doesn't matter. Kathy uses wipes prepped by a commercial lab.
 - In standard those wipes are disallowed.
 - Wipes have to be on approved materials list from design agent. Might have to be a separate issue. Pass this to BHSC main committee.
- Ask Rohit Shah to share his wet-vs-dry study. Mike Brisson to pursue.
- Compile results of studies. Tom Oatts will compile digestion info group to all.
- Legacy issue – Gary Whitney (LANL), Tom Oatts can share data. Remove from list. SRS (Steve Jahn) to do his study.
- If method is ASTM, would more labs use it? Consensus is that we need to have a standard method. Fear is that if we don't have one in place, governing agencies (e.g., OSHA) will impose one on us. Kevin Ashley should go forth with sheparding a standard development effort.
- Wet vs. dry: wait for Kathy Creek's plan.
- Worker concerns over dry wipe: have to lay info on the line. Inform folk you are doing the best you can to protect worker health. Need better linkage between workers and IH. Standard procedure would give backbone as to why we do the things we do in IH Be space. Unions are saying DOE is keeping info from workers. Our job is to convince workers we're doing the best we can to protect health.
- Should we have sampling representatives? Steve will contact his IH, Sandia and LANL. Steve will write a description. Kathy will present it to BHSC (full committee).
- National sampling group? No one here knows. Steve will check AIHA site.
- Commercial sampling efficiency data? Mike Kent (Brush Wellman) – Steve will call.
- Sampling device: Torsten Staab (LANL) – Paul Loy has done this work also. Consider contacting Staab and/or having him give a presentation.

Analysis/Accreditation

- Proficiency test samples – realistic matrices/interferences – Kevin suggested round robin – defer action pending results from questionnaire
 - Discussion on involving commercial labs: Use AIHA as conduit to convey digestion portion of questionnaire to labs. Control conflict of interest (add disclaimer) so they understand “baggage” associated with participation.
- Interferences/CRMs: await questionnaire results
- Instrumentation differences: address through validation requirements. SW-846 6020 has good wording. SW-846 Chapter One has words on validation of data, field analyses, etc.
- Standardization: Kevin will address through ASTM.

**MINUTES – Beryllium Health and Safety Committee
Analytical Subcommittee Meeting
Savannah River Site, February 11-12, 2004**

(Attachment 2, continued)

- Accreditation/Equivalency: leave open to other accreditation bodies besides AIHA.
 - 10 CFR 850 requires AIHA accreditation (para. 24f), or quality assurance for metals analysis that is equivalent to AIHA accreditation.
 - Clarification on what this means has been provided in the preliminary section of 10 CFR 850.
 - Goal: have labs follow QA system outlined in ISO 17025. Also, look at Metals European procedures.

Future Needs

- Collect data/communicate needs; await for questionnaire.
- Need calibration/QC standards that are safe to use. Avoid grinding metal to powder vs. powder vs. liquid. Pursue via CRM/NIST BeO standard.

Cross-Cut Issues

- One ASTM standard or more? Kevin wants to wait for questionnaire; can certainly take a look at what standards are now available for ICP-MS.
 - Easiest way to do standards is produce separate procedures for all non-covered methods (i.e., ASTM ICP-MS, sampling)
 - Want to write one standard for sampling, sample prep, sample analysis for a total of three.
 - A lot depends on questionnaire results.
- Publish articles: need to get all data communicated to committee and publish where appropriate. We as subcommittee may want to publish group articles.
- Common list of terms by each working group: no time to develop here. Should be done by each working group and provide to Mike Brisson for roll-up.
 - For sampling, verbiage in ASTM procedure should suffice – will review in future conference calls.
 - There are ASTM and ISO terminology documents. AIHA has in their QA manual.
- Governing entities will let us know if we're doing something wrong.
- Restrictions on travel – not much we can do but complain louder.
- Delete “work issue of conflicts between 10 CFR 850 and 851”. Individuals can make comments but the subcommittee cannot.
- LIMS interface: invite Torsten Staab to present this (along with his sampling device) at fall BHSC meeting.